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Specialized Information Services

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Thirty years ago, the National Library of Medicine established the Division of Specialized Information Services (SIS) and the Toxicology Information Program (TIP) now known as the Toxicology and Environmental Health Information Program (TEHIP). TEHIP's evolution has kept pace with the spread of, and demand for, toxicological and environmental health information, by taking advantage of new computer and communication technologies. Such mechanisms have enabled us to provide more rapid access to a wider audience. Our development of novel search capabilities means that users require less knowledge of search techniques and thus allows data to be relayed to them more efficiently. Finally, we are moving beyond the bounds of the physical National Library of Medicine, and exploring ways to point and link users to relevant sources of toxicological and environmental health information wherever they may reside. This will be accomplished primarily through the TEHIP and AIDS Web sites recently made public by SIS. Currently, refinements and additions are being made to allow easy access to a range of information collected by this Division of NLM.

In FY 1997 SIS reexamined the scope and coverage of current SIS programs, proposed new opportunities to enhance SIS information services, and investigated emerging areas, including the application of new multimedia technology in the delivery of information services. This examination was initiated using the mechanism of an Institute of Medicine evaluation of the TEHIP Program, and a report from this study, *Toxicology and Environmental Health Information resources: the Role of the National Library of Medicine*, was released in the spring of 1997.

TOXNET

The **Toxicology Data Network** (TOXNET), the Library's networked microprocessor system, has upgraded more microprocessors to Pentium machines to better serve the public. Work continued on the further enhancement and implementation of the Windows workstation for building and updating Hazardous Substances Data Bank (HSDB) records and other TOXNET files.

The TOXNET System Contractor completed a study of new platform alternatives and has recommended the most advantageous hardware environment (a Unix-based platform) to NLM for implementation in FY 1998. A major enhancement to the search/retrieval module is in progress. A World Wide Web search interface to TOXNET is being developed to facilitate searches by TOXNET users coming through the Internet. Initially, the Web interface will allow searching of the HSDB, CCRIS, IRIS, RTECS, and GENE-TOX databanks. Additional files will be added as soon as possible.

Databases under TOXNET

The **Hazardous Substances Data Bank** (HSDB) continues to be the most highly used databank on TOXNET, averaging over 6,000 searches each month. Increased emphasis was placed on providing more data on human toxicology and clinical medicine within HSDB, in keeping with earlier recommendations of the Board of Regents Subcommittee on TEHIP. Changes to the composition of the Scientific Review Panel are being made to accommodate the shift in content emphasis. Newer sources of relevant data are being examined

for incorporation into new and existing data fields within the current 4,520 HSDB records. More records are being processed through special enhancements, including source updates from various peer-reviewed files. These enhancements are being made possible by a customized Windows-based PC workstation with enhanced file-building features.

The **Toxic Chemical Release Inventory** (TRI) series of files now includes nine online files, TRI87 through TRI95. These Environmental Protection Agency-sponsored files remain an important resource for environmental release data and continue to attract new users. They contain data on environmental release data to air, water, and soil for over 600 EPA-specified chemicals. Starting with the TRI91 file, reporting facilities were required to report source reduction and recycling activities, in addition to environmental releases, which has considerably increased the size and complexity of the databases.

The TRI95 file was released in May 1997. EPA included over 300 additional chemicals in TRI95, as well as required submissions from federal facilities and military installations. Another major change in TRI95 was the change to two versions of the reporting form, a long and a short form, requiring unit record changes in TOXNET. TRIFACTS, a companion file to the TRI series, supplies users with information related to health and ecological effects and the safety and handling of the TRI chemicals. These records are supplied by EPA, which also funds the management and maintenance of the TRI files.

The **Chemical Carcinogenesis Research Information System** (CCRIS) continues to be built, maintained, and made publicly accessible by NLM. This databank is supported by the National Cancer Institute and has grown to 7,555 records. The chemical-specific data covers the areas of carcinogenesis, mutagenesis, tumor promotion, and tumor inhibition.

The **Integrated Risk Information System** (IRIS), EPA's official health risk assessment file, continues to experience high usage on TOXNET and to be very popular with the user community. During FY 1996, EPA introduced a version of IRIS on the Agency's Web page. IRIS now contains 666 chemicals.

The **GENE-TOX** file continues to be built and updated directly on TOXNET by EPA scientific staff. This file contains peer-reviewed genetic toxicology (mutagenicity) studies for about 300 chemicals. GENE-TOX is much used by scientists in other countries.

The **Registry of Toxic Effects of Chemical Substances** (RTECS) is a databank based upon a National Institute of Occupational Safety and Health (NIOSH) file by the same name which NLM has restructured and made available for online searching. SIS continues to add new data to this file as NIOSH makes them available. This year, information on a standard European reference, the Beilstein Number and Reference, was added to the file. Now that NIOSH no longer prints the full RTECS, online access via NLM to this widely used resource including over 139,000 chemical records has become even more important.

The **Developmental and Reproductive Toxicology** (DART) database now contains over 35,000 citations from literature published since 1989 on agents that may cause birth defects. Records from DART are also added quarterly to TOXLINE. DART is a continuation of the Environmental Teratology Information Center backfile (ETICBACK) database, which contains almost 50,000 citations to literature published from 1950 to 1989. ETICBACK citations are also found in TOXLINE. DART is funded by NLM, the EPA, the National Institute of Environmental Health Sciences (NIEHS), and the FDA's National Center for Toxicological Research, and is managed by NLM.

The **Environmental Mutagen Information Center** (EMIC) database contains over 17,000 citations to literature on agents that have been tested for genotoxic activity. A backfile for EMIC (EMICBACK) contains over 75,000 citations to the literature published from 1950 to 1991. Records from EMICBACK are

included in TOXLINE. Plans are under way to add the records from the new EMIC database to TOXLINE as well. EMIC is funded by the EPA and the NIEHS and managed by NLM.

Databases under ELHILL

ChemID (Chemical Identification File) is an NLM online chemical dictionary that contains over 340,000 records, primarily describing chemicals of biomedical and regulatory importance. It also contains an important set of regulatory data, collectively known as SUPERLIST. Over 13,000 records are augmented with the name and an indication of source for chemicals mentioned in one or more of 31 lists, e.g., the Priority List of the Agency for Toxic Substances and Disease Registry (ATSDR). These data allow users to determine if a chemical is mentioned on a given list and under what name, as well as to search for chemical classes on these lists. In FY 1997, new data from the EPA Master Testing List status was added to ChemID. During FY 1998, an extensive quality control effort will be continued on data in this file and new nomenclature data will be added to enrich the file content because of the impending retirement of CHEMLINE.

CHEMLINE (Chemical Dictionary Online) is an online chemical dictionary and directory file that allows users to identify chemical substances via nomenclature and other identifiers, and to formulate optimum search strategies for other NLM files. CHEMLINE is updated every two months and regenerated annually. The basic foundation of CHEMLINE's data is supplied by the Chemical Abstracts Service from its Registry System, and this is augmented extensively by NLM with nonproprietary data from a variety of sources. CHEMLINE now contains over 1,600,000 records on chemical substances. On January 1, 1988, CHEMLINE will no longer be carried by NLM since it is a royalty-based file requiring payment of usage fees through NTIS.

TOXLINE (Toxicology Information Online) is an NLM online bibliographic retrieval service produced by merging "toxicology" subsets from some 18 secondary sources. TOXLINE and its backfile, TOXLINE65, contain data from sources that do not require royalty charges based on usage. Because the Chemical Abstracts Service requires usage royalties, NLM has separated information from this source into two online bibliographic files, **TOXLIT** and **TOXLIT65**. At the start of FY 1998 all these toxicology bibliographic files together contained over 4 million citations.

In FY 1998, as NLM moves more toward providing even more free Internet access, the two files with CAS licensed data, as in the case with CHEMLINE, will also be discontinued. We also will continue to consider ways that the Unified Medical Language System can be utilized to accommodate vocabulary changes in TOXLINE subfiles and help users who will access our data through Internet Grateful Med. IGM access is expected during FY 1998.

The decision to no longer carry the TOXLIT files has prompted NLM to establish a working group to explore alternative ways to acquire toxicology bibliographic information. During FY 1997, SIS collaborated with NIOSH in evaluating the use of their NIOSHTIC database, which is also included in TOXLINE. We are exploring possible options to replace this information or share efforts with NIOSH to create it should NIOSH decide to discontinue building it as they have in the past.

DIRLINE (Directory of Information Resources Online) is NLM's online directory of resources including organizations, databases, bulletin boards, as well as projects and programs with special biomedical subject focus. These resources provide information to users that may not be available from one of the other NLM bibliographic or factual databases.

The availability of DIRLINE via the Internet through NLM's Locator continues to result in a high level of use of the database and a higher level of recognition of its utility by biomedical librarians, health professionals, and the public. Increased funding for database maintenance has made it possible to improve the

quality and timeliness of the content of the database and improve collaboration with other subfile producers. An online version of *Health Hotlines*, NLM's popular publication listing toll-free telephone numbers to health-related sources, was made available this year through the SIS Web site. In FY 1997, DIRLINE was also added to the list of databases available free via the Internet Grateful Med.

AIDS Services

The recommendations from the 1993 NIH HIV/AIDS Information Services Conference remain the guide for NLM's HIV/AIDS information programs and services. In 1996 NLM initiated a World Wide Web Homepage for AIDS (http://sis.nlm.nih.gov/aidswww.htm). This distribution mechanism has enhanced NLM's ability to get important information to the people who need it. In addition to links with NLM's online databases, fact sheets, and publications, links to other NIH components are available as part of a new online version of the Guide to NIH HIV/AIDS Information Services. New databases of abstracts presented at important AIDS conferences have also been made available through this mechanism prior to their addition to AIDSLINE.

Two collaborative projects with other PHS agencies, the AIDS Clinical Trials Information Service (ACTIS) and the HIV/AIDS Treatment Information Service (ATIS) continue to be very successful. While direct online use of the AIDSTRIALS and AIDSDRUGS databases has stabilized, many other information providers are downloading the data and adding it to their services. A number of bulletin boards and World Wide Web servers are providing the data to their users in a variety of formats and the data have also been distributed internationally through this mechanism. In addition, in FY 1997 AIDSTRIALS and AIDSDRUGS became available for searching via Internet Grateful Med.

NLM initiated a fourth round of AIDS Outreach Purchase Orders in FY 1997 and made awards to 20 community-based organizations and libraries. Six previously funded projects that had shown evidence of success received funding to continue or expand their activities.

NLM has continued to work with the Health Information Center at the Wheaton Regional Library (Montgomery Country, Maryland) on the collaborative project in AIDS and toxicology information. Outreach programs have taken place at the library, which have brought in new users for the electronic services. Wheaton Library staff have developed and conducted training for the public in the use of the World Wide Web for information retrieval. Satellite centers are being established in the three other regional libraries that will bring health resources to consumers throughout the county.

Training and outreach to the Historically Black Colleges and Universities has resulted in the development of training materials with culturally specific content. A number of training sessions were held during the year with very positive feedback from the trainees.

Other Programs

Internet

The NLM and SIS gopher servers were taken out of service, since most Internet usage now comes to the World Wide Web servers. All content was converted to the World Wide Web servers.

The SIS WWW servers offered a variety of new services in 1997. New searchable versions of *Health Hotlines*, as well as meeting abstracts of the 4th Conference on Retroviruses and Opportunistic Infections were made searchable under WAIS-SF. A new Chemical Structure Search Page was made available on a separate server, and allowed searching HSDB structures using structural input and output. Our online training

capabilities were expanded with the advent of Toxicology Tutor on the Web, which used the latest Javascript capability to present fundamental concepts in toxicology, and new online file demonstration packages were made available using Javascript. A new HTML version of the Calendar of Events in Toxicology and Environmental Health was also made public. The publication, *Bibliography on Alternatives to the Use of Live Vertebrates in Biomedical Research and Testing* was moved from the gopher to the WWW, and hypertext versions of the latest editions were made available. A new Bibliography on Environmental Justice was also developed and published on the WWW server in HTML format.

Outreach

SIS continues its support of the Toxicology Information Outreach Project. The objective of this initiative is to strengthen the capacity of Historically Black Colleges and Universities (HBCUs) to train medical and other health professionals in the use of NLM's toxicological, environmental, occupational health, and hazardous wastes information resources. In addition to providing workstations, training, and free online access to nine HBCUs participating in a pilot training development project, NLM has collaborated with the Agency for Toxic Substances and Disease Registry (ATSDR) to train representatives from 61 additional schools in the use of NLM's valuable online resources. During the past fiscal year, one of the training classes was hosted by Texas Southern University and it included HBCUs and community-based organizations from the Lower Mississippi Delta. This class was jointly sponsored by ATSDR, NLM, and the EPA's Environmental Justice Office in support of the Mississippi Delta Project.

User Support Computer-Based Activities

A new version of *Toxicology Tutor*, developed in FY 1996, was released for the Internet this year, and is available on the SIS Web server. Also, SIS developed a computer-based demo for the Internet illustrating the TEHIP databases: CHEMLINE, TOXLINE, RTECS, HSDB, CCRIS, IRIS, TRI, TRIFACTS, GENETOX, EMIC, and DART. It was released in FY 1997, together with an Internet version of the TEHIP slide overview.

Alternatives to Animal Testing

SIS continued to compile and publish references from the MEDLARS files that were identified as relevant to methods or procedures which could be used to reduce, refine, or replace animals in biomedical research and toxicological testing. Requests for these quarterly bibliographies have increased, as has the number of articles deemed relevant to the field. Bibliographies issued during the past four years are available on the Internet through the SIS WWW Server.